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EXAMINER	
VO, TUNG T	

ART UNIT	PAPER NUMBER
2613	

DATE MAILED: 12/13/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/747,945	WILENSKY, GREGG D.
	Examiner	**Art Unit**
	Tung T. Vo	2613

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *03* MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 July 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-98* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-98* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 1, 20, 49-51, and 98 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-3, 20-22, 50-53, 70-71, and 98 are rejected under 35 U.S.C. 102(e) as being anticipated by Cornog et al. (US 6,570,624 B2) in view of Wilensky et al (US 6,721,446).

Re claims 1-3, 20-22, 50-53, 70-71, and 98, Cornog discloses a method for masking (fig. 1) a foreground portion from a background portion of a video (FG1 and FG2 of fig. 4A) , the method comprising: receiving a first input (100 of fig. 1) defining a first border region (FG1, FIRST IMAGE (A) of fig. 4A) that includes a border between a foreground portion (FG1 of fig. 4A) and background portion (BG of fig. 4A) of a first image (FIRST IMAGE (A) of fig. 4A), the first digital image being one of a sequence of images defining a digital video, the first border region (FG1 must has a border between the foreground FG1 and BG of the first image) further including only a part of the foreground portion and only a part of the background

portion; receiving a second input (102 of fig. 1) defining a second border region (FG2 of fig. 4A) that includes a border (the foreground has a border between foreground and background BG) in a second digital image (SECOND IMAGE (B) of fig. 4A), the second image being another one of the sequence of digital images, the second border region further including only a part of the foreground portion and only a part of the background portion (FG2 and BG of fig. 4A); interpolating (114 of fig. 1, e.g. the first image and the second image are blended together called interpolating process) between the first and second border regions to define an intermediary border region (COMBINATION MAP of fig. 4B, e.g. the first border of the first image and the second border of the second image are combined, interpolated to form the intermediate border) for an image intermediary in the sequence to the first and second digital images (fig. 4B; See also col. 13, line 29-col.14, line 13); and using the first, second, and intermediary border regions for (116 of fig. 1) masking the foreground portion from the background portion in the digital video (fig. 4B; see also col. 14, lines 14-37); wherein receiving a first and a second input (100 and 102 of fig. 1) comprise: receiving user inputs (100 and 102 of fig. 1; 1002 and 1004 of fig. 10) defining the border regions; and where interpolating an intermediary border region (1012 of fig. 10) comprises: interpolating (114 of fig. 1) an intermediary border region automatically without user input; wherein using the first, second, and intermediary border regions for masking (col. 14, lines 13-38) the foreground portion from the background portion comprises: determining for a pixel in a border region whether it includes data that is associated with the foreground portion (510, 512, 514 of fig. 5A); and using the result of the determining step to mask the foreground portion from the background portion in the digital video (fig. 5B).

It is noted that Cornog does not particularly teach a sequence of digital images that define video as claimed.

However, Wilensky et al. teaches a sequence of digital images that define video used to perform the intrinsic color between regions of digital images (figs. 1-12, see also Abstract and col. 4, line 45 – col. 5, line49). Therefore, taking the teachings of Cornog and Wilensky as a whole, it would have been obvious to one of ordinary skill in the art to incorporate the teachings of Wilensky into the method of Cornog for the same purpose of interpolating the first and second border regions to define intermediate border regions of the digital video image. Doing so would provide the masking and extracting of object from digital images is achieved with high accuracy, and multiple object can be extracted from an image in a single step.

4. Claims 1-4, 7-9, 19, 20, 38, 49-51, 69 and 87 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen (US 6,556,704 B1) in view of Wilensky et al (US 6,721,446).

Re claims 1, 20, and 49-51, Chen teaches a method that is implemented on the computer (fig. 12) for masking a foreground portion of a digital image from a background portion of a digital image (218 of fig. 6), the digital image being part of a video comprising a time sequence of digital images (211b, TOP IMAGE, 211a, BOTTOM IMAGE of fig. 6), each image being defined by a plurality of pixels (col. 3, fig. 1, e.g. pixel locations), the method comprising: receiving a first input defining a first border region (14a of fig. 1), the first border region including at least a part of the foreground portion (14a of fig. 1 is a part of the foreground) and at least a part of the background portion (15a of fig. 1) in a first digital image (BOTTOM IMAGE of fig. 1); receiving a second input defining a second border region (14b and 15b of fig.

1), the second border region including at least a part of the foreground portion (14b of fig. 1) and at least a part of the background portion (15b of fig. 1) in a second digital image (TOP IMAGE of fig. 1); interpolating an intermediary border region for an image intermediary in time to the first and second digital images (fig. 11, col. 11, line 31 through col. 12, line 30); and using the first, second, and intermediary border regions for masking the foreground portion from the background portion in the digital video (20 of figs. 1, 2; and 218 of fig. 6; see also col. 10 line 67 through col. 11, line 30).

It is noted that Chen does not particularly teach a sequence of digital images that define video as claimed.

However, Wilensky et al. teaches a sequence of digital images that define video used to perform the intrinsic color between regions of digital images (figs. 1-12, see also Abstract and col. 4, line 45 – col. 5, line49). Therefore, taking the teachings of Chen and Wilensky as a whole, it would have been obvious to one of ordinary skill in the art to incorporate the teachings of Wilensky into the method of Chen for the same purpose of interpolating the first and second border regions to define intermediate border regions of the digital video image. Doing so would provide the masking and extracting of object from digital images is achieved with high accuracy, and multiple object can be extracted from an image in a single step.

Re claim 2, Chen further teaches wherein receiving a first and a second input comprise: receiving user inputs defining the border regions (116 and 118 of fig. 12); and where interpolating an intermediary border region comprises: interpolating an intermediary border region automatically without user input (218 of fig. 6, e.g. an algorithm (218) generates foreground depth mask formation).

Re claim 3, Chen further teaches determining for a pixel in a border region whether it includes data that is associated with the foreground portion (216 of fig. 6, col. 7, line 29 through col. 10, line 4); and using the result of the determining step to mask the foreground portion from the background portion in the digital video (col. 10, line 8, through col. 11, line 15).

Re claim 4, Chen further teaches estimating an intrinsic color value for a pixel in the first, second, and intermediary border regions (col. 10, lines 6-66); and using the estimated intrinsic color value for extracting the foreground portion from the background portion (fig. 9).

Re claim 7, Chen further teaches wherein receiving inputs indicating the border regions comprise: generating a single path having a width encompassing that of the border region (812 of fig. 11).

Re claim 8, Chen further teaches wherein generating a single path comprises: generating a vector-based single path (col. 10, lines 60-66).

Re claims 9, Chen further teaches generating a single path having variable thickness throughout its length (fig. 11).

Re claims 19, 38, 69 and 87, Chen further teaches wherein the foreground portion is an object (14a, 14b of fig. 1).

5. Claims 1-9, 19, 49, and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Totsuka et al. (US 6,128,046) in view of Cornog et al. (US 6,570,624 B2).

Re claims 1, Totsuka teaches a method for masking a foreground portion of a digital image from a background portion of a digital image, the digital image being part of a video comprising a time sequence of digital images, each image being defined by a plurality of pixels

(figs. 2A-2C), the method comprising: receiving a first input defining a first border region (object at t=t1 of fig. 3A), the first border region including at least a part of the foreground portion and at least a part of the background portion in a first digital image (Frame t=t1 of fig. 3A); receiving a second input defining a second border region (Object at t=t2 of fig. 3A), the second border region including at least a part of the foreground portion and at least a part of the background portion in a second digital image; interpolating an intermediary border region for an image intermediary in time to the first and second digital images (Steps S5-1-S5-5 of fig. 29); and using the first, second, and intermediary border regions for masking the foreground portion from the background portion in the digital video (S5-5 of fig. 29).

It is noted that Totsuka does not particularly teach the interpolating between its frames and border regions as claimed.

However, Cornog teaches receiving a first input (100 of fig. 1) defining a first border region (FG1, FIRST IMAGE (A) of fig. 4A) that includes a border between a foreground portion (FG1 of fig. 4A) and background portion (BG of fig. 4A) of a first image (FIRST IMAGE (A) of fig. 4A), the first digital image being one of a sequence of images defining a digital video, the first border region (FG1 must has a border between the foreground FG1 and BG of the first image) further including only a part of the foreground portion and only a part of the background portion; receiving a second input (102 of fig. 1) defining a second border region (FG2 of fig. 4A) that includes a border (the foreground has a border between foreground and background BG) in a second digital image (SECOND IMAGE (B) of fig. 4A), the second image being another one of the sequence of digital images, the second border region further including only a part of the foreground portion and only a part of the background portion (FG2 and BG of

fig. 4A); interpolating (114 of fig. 1, e.g. the first image and the second image are blended together called interpolating process) between the first and second border regions to define an intermediary border region (COMBINATION MAP of fig. 4B, e.g. the first border of the first image and the second border of the second image are combined, interpolated to form the intermediate border) for an image intermediary in the sequence to the first and second digital images (fig. 4B; See also col. 13, line 29-col.14, line 13).

Therefore, taking the teachings of Totsuka and Cornog as a whole, it would have been obvious to one of ordinary skill in the art to incorporate the teachings of Cornog into the method of Totsuka for the same purpose of interpolating its frames or images. Doing so would reduce the time of operation and the cost of the system.

Re claims 2, 21, and 22, Totsuka further teaches wherein receiving a first and a second input comprise: receiving user inputs defining the border regions (Object segmentation of Frame, at t=t1 and t=t2 of fig. 3A); and where interpolating an intermediary border region comprises: interpolating an intermediary border region automatically without user input (fig. 29).

Re claim 3, Totsuka further teaches determining for a pixel in a border region whether it includes data that is associated with the foreground portion (fig. 2A); and using the result of the determining step to mask the foreground portion from the background portion in the digital video (fig. 2C).

Re claims 4 and 23, Totsuka further teaches estimating an intrinsic color value for a pixel in the first, second, and intermediary border regions (fig. 12); and using the estimated intrinsic color value for extracting the foreground portion from the background portion (fig. 18).

Re claims 5 and 26, Totsuka further teaches wherein receiving inputs indicating the border regions comprises: generating an inside path located inside a foreground portion (P2 of fig. 28B); and generating an outside path located outside the foreground portion and enclosing the inside path (P1 of fig. 28B), wherein pixels between the inside and outside paths belong to a border region (PATH AREA has pixel of fig. 28B).

Re claims 6 and 27, Totsuka further teaches wherein generating an inside path and an outside path comprise: generating a vector-based inside path and a vector-based outside path (10 of fig. 30).

Ré claims 7 and 28, Totsuka further teaches wherein receiving inputs indicating the border regions comprise: generating a single path having a width encompassing that of the border region (PATH segment of fig. 28B).

Re claims 8 and 27, Totsuka further teaches wherein generating a single path comprises: generating a vector-based single path (fig. 28A).

Re claims 9, Totsuka further teaches generating a single path having variable thickness throughout its length (fig. 28B).

Re claims 19, 38, 69 and 87, Totsuka further teaches wherein the foreground portion is an object (fig. 3A).

Re claims 53-59, see the analysis in claims 1-9.

6. Claims 1-2, 19-21, 38, 49-52, 69, 87, and 98 are rejected under 35 U.S.C. 103(a) as being unpatentable over Norton et al. (US 5,912,994) in view of Cornog et al. (US 6,570,624 B2).

Re claims 1-2, 19-21, 38, 49-52, 69, 87, and 98, Norton teaches a method that is implemented on the computer (figs. 1-6) for masking a foreground portion of a digital image from a background portion of a digital image (fig. 2), the digital image being part of a video comprising a time sequence of digital images, each image being defined by a plurality of pixels, the method comprising: receiving a first input defining a first border region (42 of fig. 2), the first border region including at least a part of the foreground portion and at least a part of the background portion in a first digital image; receiving a second input defining a second border region (42 of fig. 2, more objects of the second frame or image), the second border region including at least a part of the foreground portion and at least a part of the background portion in a second digital image; interpolating an intermediary border region for an image intermediary in time to the first and second digital images (60 of fig. 3); and using the first, second, and intermediary border regions for masking the foreground portion from the background portion in the digital video (56 of fig. 3); wherein receiving a first and a second input comprise: receiving user inputs defining the border regions (fig. 1); and where interpolating an intermediary border region comprises: interpolating an intermediary border region automatically without user input (12 of fig. 1,e.g. the processor has an automatic function to do the interpolating the intermediary bolder regions).

It is noted that Norton does not particularly teach the interpolating between its frames and border regions as claimed.

However, Cornog teaches receiving a first input (100 of fig. 1) defining a first border region (FG1, FIRST IMAGE (A) of fig. 4A) that includes a border between a foreground portion (FG1 of fig. 4A) and background portion (BG of fig. 4A) of a first image (FIRST

IMAGE (A) of fig. 4A), the first digital image being one of a sequence of images defining a digital video, the first border region (FG1 must has a border between the foreground FG1 and BG of the first image) further including only a part of the foreground portion and only a part of the background portion; receiving a second input (102 of fig. 1) defining a second border region (FG2 of fig. 4A) that includes a border (the foreground has a border between foreground and background BG) in a second digital image (SECOND IMAGE (B) of fig. 4A), the second image being another one of the sequence of digital images, the second border region further including only a part of the foreground portion and only a part of the background portion (FG2 and BG of fig. 4A); interpolating (114 of fig. 1, e.g. the first image and the second image are blended together called interpolating process) between the first and second border regions to define an intermediary border region (COMBINATION MAP of fig. 4B, e.g. the first border of the first image and the second border of the second image are combined, interpolated to form the intermediate border) for an image intermediary in the sequence to the first and second digital images (fig. 4B; See also col. 13, line 29-col.14, line 13).

Therefore, taking the teachings of Norton and Cornog as a whole, it would have been obvious to one of ordinary skill in the art to incorporate the teachings of Cornog into the method of Norton for the same purpose of interpolating its frames or images. Doing so would reduce the time of operation and the cost of the system.

7. Claims 1-98 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pettigrew et al. as shown in figures 1-32, and further in view of Cornog et al. (US 6,570,624 B2).

It is noted that Pettigrew does not particularly teach the interpolating between its frames and border regions as claimed.

However, Cornog teaches receiving a first input (100 of fig. 1) defining a first border region (FG1, FIRST IMAGE (A) of fig. 4A) that includes a border between a foreground portion (FG1 of fig. 4A) and background portion (BG of fig. 4A) of a first image (FIRST IMAGE (A) of fig. 4A), the first digital image being one of a sequence of images defining a digital video, the first border region (FG1 must has a border between the foreground FG1 and BG of the first image) further including only a part of the foreground portion and only a part of the background portion; receiving a second input (102 of fig. 1) defining a second border region (FG2 of fig. 4A) that includes a border (the foreground has a border between foreground and background BG) in a second digital image (SECOND IMAGE (B) of fig. 4A), the second image being another one of the sequence of digital images, the second border region further including only a part of the foreground portion and only a part of the background portion (FG2 and BG of fig. 4A); interpolating (114 of fig. 1, e.g. the first image and the second image are blended together called interpolating process) between the first and second border regions to define an intermediary border region (COMBINATION MAP of fig. 4B, e.g. the first border of the first image and the second border of the second image are combined, interpolated to form the intermediate border) for an image intermediary in the sequence to the first and second digital images (fig. 4B; See also col. 13, line 29-col.14, line 13). Therefore, taking the teachings of Pettigrew and Cornog as a whole, it would have been obvious to one of ordinary skill in the art to incorporate the teachings of Cornog into the method of Pettigrew for the same purpose of

interpolating its frames or images. Doing so would reduce the time of operation and the cost of the system.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tung T. Vo whose telephone number is (703) 308-5874. The examiner can normally be reached on 6:30 AM - 3:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chris. Kelley can be reached on (703) 305-4856. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TUNG T. VO
PATENT EXAMINER

Tung T. Vo
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